

PERFORMANCE REPORT

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FEDERAL AID IN SPORT FISH RESTORATION ACT

TEXAS

FEDERAL AID PROJECT F-221-M-1

INLAND FISHERIES DIVISION MONITORING AND MANAGEMENT PROGRAM

2010 Survey Report

**Lone Star Lake**

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## SURVEY AND MANAGEMENT SUMMARY

Fish populations in Lone Star Lake were surveyed in 2010 using electrofishing and trap netting and in 2011 using gill netting. This report summarizes the results of the surveys and contains a management plan for the reservoir based on those findings.

- **Reservoir description:** Lone Star Lake is a 1,516-acre impoundment located on Ellison Creek in the Cypress River Basin in Morris County. Structural habitat is sparse, but is comprised of inundated timber, brush, riprap, creek channels, and boat docks. Native aquatic plant abundance has recently decreased. Hydrilla was discovered in the reservoir in 2006, but coverage was less in 2010 than the 2006 survey. A fish-consumption advisory was issued due to PCB contamination in 2005.
- **Management history:** Important sport fish include channel catfish, white bass, palmetto bass, and largemouth bass. All sport fish have historically been managed with statewide harvest regulations. Florida largemouth bass have been stocked in this reservoir to improve the quality of the largemouth bass fishery. Palmetto bass stocking was discontinued in 2005 due to the fish consumption advisory. Hydrilla was discovered in the reservoir in 2006 and herbicide treatments were conducted in 2006 and 2007. Environmental conditions have reduced the coverage of all aquatic plants in the reservoir in recent years.
- **Fish community**
  - **Prey species:** Threadfin shad were collected during the 2010 fall electrofishing survey. Electrofishing catch rates of gizzard shad were relatively low with 42% of the fish available as prey to most sport fish. Bluegill, redbreast sunfish, and redear sunfish were also available as prey and were abundant.
  - **Catfishes:** The majority of channel catfish collected during the 2011 gill netting survey were above the legal length limit (12 inches). The abundance of channel catfish has steadily increased in the reservoir since 2005.
  - **Temperate basses:** White bass and palmetto bass (hybrid striped bass) were present in the reservoir. Relative abundance of white bass has decreased in recent years. Only three white bass were collected during the 2011 gill netting survey. Palmetto bass stocking was discontinued following a fish consumption advisory issued by the Texas Department of State Health Services.
  - **Black basses:** The abundance of spotted bass was higher in 2010 compared to previous surveys. Even though the total catch of largemouth bass has declined, the number of legal-size fish has been stable. Relative weights were good for all inch groups, indicating adequate prey availability. Largemouth bass had fast growth rates, reaching legal-size in three growing seasons.
  - **Crappie:** No crappie were collected during the 2010 trap netting survey. In 2006, both white and black crappie were observed during fall trap net surveys, but only one fish of each species was collected.
- **Management strategies:** Conduct electrofishing surveys every other year beginning in 2012, and general monitoring with gill nets in 2015. Hydrilla surveys will be conducted annually. Technical guidance will be given to controlling authority regarding the management of invasive aquatic vegetation. All sport fish will continue to be managed under statewide harvest regulations.

## INTRODUCTION

This document is a summary of fisheries data collected from Lone Star Lake from June 2010 through May 2011. The purpose of the document is to provide fisheries information and make management recommendations to protect and improve the sport fishery. While information on other fishes was collected, this report deals primarily with major sport fishes and important prey species. Historical data are presented with the 2010-2011 data for comparison.

### *Reservoir Description*

Lone Star Lake is a 1,516-acre impoundment constructed in 1943 on Ellison Creek in the Cypress River Basin. It is located in Morris County in the City of Lone Star. The controlling authority is U. S. Steel Tubular Products, Inc. Primary water uses are industrial water supply and public recreation. It has a watershed of approximately 37 square miles, a shoreline length of 14 miles, and a shoreline development index of 2.6. Structural habitat is sparse, but is comprised of inundated timber, brush, riprap, creek channels, and boat docks. Aquatic plant abundance has decreased since the 2006 survey. Boat access consisted of two public boat ramps and one private boat ramp. Bank fishing access is limited. Other descriptive characteristics for Lone Star Lake are in Table 1. The Texas Department of State Health Services issued a fish consumption advisory due to PCB contamination in 2005.

### *Management History*

**Previous management strategies and actions:** Management strategies and actions from the previous survey report (Bister and Brice 2007) included:

1. Provide technical guidance to the controlling authority regarding hydrilla management in the reservoir. Conduct annual hydrilla surveys to monitor trends and estimate abundance of this invasive aquatic plant.  
**Action:** Annual invasive aquatic vegetation surveys have been conducted and results have been reported to the controlling authority and interested homeowner groups. Herbicide treatments of hydrilla were conducted in 2006 (12 acres) and 2007 (50 acres). Alligatorweed (4 acres) and coontail (6 acres) were also treated in 2007. Environmental conditions in the reservoir have suppressed aquatic plant growth in recent years and no treatments have been necessary.
2. Stock Florida largemouth bass (FLMB) at 100 fish/acre in 2008 and 2009. Conduct electrofishing survey in fall 2008 and 2010 to monitor largemouth bass and prey fish populations. Assess largemouth bass population genetics in fall 2012.  
**Action:** Florida largemouth bass were stocked in 2008 and 2009. Electrofishing was conducted in 2008 and 2010. Genetic analysis will be conducted during the fall 2012 electrofishing survey.
3. Keep anglers and other public aware of harvest regulations, fishing methods, and other fisheries-related topics.  
**Action:** District staff continue to inform anglers about largemouth bass fishing opportunities at Lone Star Lake.

**Harvest regulation history:** Sport fishes in Lone Star Lake are currently managed with statewide regulations (Table 2).

**Stocking history:** Lone Star Lake was stocked with Florida largemouth bass fry in 1990, and fingerlings in 1995, 2008, and 2009. Palmetto bass were stocked in the reservoir in 1983, 1997, 1999, 2002, 2004, and 2005. Palmetto bass stocking was discontinued after a fish consumption advisory for PCB contamination was issued for the reservoir in 2005. The complete stocking history is presented in Table 3.

**Vegetation/habitat history:** In 2006, aquatic vegetation covered approximately 355 acres (25%), with coontail (287 acres) the dominant plant species (Bister and Brice 2007). The coverage estimated in 2006 was a substantial increase compared to previous years. Ryan and Brice (2003) reported aquatic vegetation coverage was <4% of the total reservoir surface area. The discovery of hydrilla in 2006 (36 acres) was a cause of concern for lake residents and the controlling authority. District staff discussed various options to control hydrilla with the controlling authority, which resulted in chemical treatment of 12 acres in 2006. Lone Star Steel contracted to have up to 50 acres of hydrilla treated during June 2007. In recent years, environmental conditions have resulted in the loss of a large portion of submersed aquatic vegetation in the reservoir.

**Water transfer:** Lone Star Lake is primarily used for industrial water supply and recreation. There are currently no pumping stations on the reservoir that transfer water to other locations.

## METHODS

Fishes were collected by electrofishing (1.0 hour at 12, 5-min stations), gill netting (5 net nights at 5 stations), and trap netting (5 net nights at 5 stations). An aquatic vegetation and habitat survey was conducted in August 2010. Catch per unit effort (CPUE) for electrofishing was recorded as the number of fish caught per hour (fish/h) of actual electrofishing and, for gill and trap netting, as the number of fish per net night (fish/nn). All survey sites were randomly selected and electrofishing, gill netting, trap netting, vegetation, and angler access surveys were conducted according to the Fishery Assessment Procedures (TPWD, Inland Fisheries Division, unpublished manual revised 2009).

Sampling statistics (CPUE for various length categories), structural indices [Proportional Size Distribution (PSD), as defined by Guy et al. (2007)], and condition indices [relative weight ( $W_r$ )] were calculated for target fishes according to Anderson and Neumann (1996). Index of vulnerability (IOV) was calculated for gizzard shad (DiCenzo et al. 1996). Relative standard error ( $RSE = 100 \times SE \text{ of the estimate/estimate}$ ) was calculated for all CPUE statistics and SE was calculated for structural indices and IOV. Average age-at-length was determined using otoliths for largemouth bass from 13.1 to 14.8 inches in 2008 ( $N = 12$ ) and 13.3 to 14.4 inches in 2010 ( $N = 15$ ). Source for water level data was U. S. Steel Tubular Products, Inc.

## RESULTS AND DISCUSSION

**Habitat:** Approximately 62% of the reservoir perimeter was natural shoreline (Table 4). Structural habitat was sparse. Aquatic vegetation coverage greatly declined since the last survey report. During the 2006 survey, approximately 25% (354 acres) of the lake surface area was covered with aquatic vegetation. Only 110 acres of aquatic plants were encountered during the 2010 survey (Table 4). Hydrilla coverage has declined from 36 acres in 2006 to approximately 10 acres in 2010 (Table 4).

**Prey species:** Gizzard shad, threadfin shad, and several sunfish species were present, indicating good forage fish diversity. Electrofishing catch rates of gizzard shad and bluegill were 77.0/h and 819.0/h, respectively. Index of vulnerability (IOV) for gizzard shad was moderate, indicating 42% of gizzard shad were available to most predators, which was higher than 2008 but similar to IOV estimates in 2006 (Figure 3). Electrofishing catch rate of gizzard shad in 2010 was slightly lower than 2008 (101.0/h) and slightly higher than 2006 (63.0/h) (Figure 3). Electrofishing catch rates of bluegill were much higher in 2010 than in 2008 (413.0/h) and 2006 (663.0/h) surveys, with abundant small individuals available as prey (Figure 5). The combined catch rate for sunfish species has increased from 975/h in 2006 (Bister and Brice 2007) to 1,428/h in 2010.

**Channel catfish:** Channel catfish have been the only catfish species collected during recent fish population surveys at Lone Star Lake. The gill net catch rate of channel catfish in the reservoir has steadily

increased from 6.0/nn in 2005 to 11.0/nn in 2007 and 14.0/nn in 2011 (Figure 7). Even though age-and-growth analyses were not conducted during the 2011 gill net survey, historic growth of channel catfish was good with fish attaining legal-size ( $\geq 12$  inches) during their third growing season (Ryan and Brice 2003). Body condition was excellent with mean  $W_t$  for most inch groups  $>95$  (Figure 7).

**Temperate bass:** The gill net catch rate of white bass has decreased dramatically compared to previous surveys. The white bass catch rate in gill nets was only 0.6/nn in 2011 compared to 14.4/nn in 2007 and 5.0/nn in 2005 (Figure 8). This was likely due to limited spawning habitat for white bass and unpredictable reproduction and recruitment in the reservoir. Only two palmetto bass were collected during the 2011 gill netting survey (Figure 9). Palmetto bass stocking was discontinued in the reservoir following a fish consumption advisory issued by the Texas Department of State Health Services.

**Black bass:** The electrofishing catch rate of spotted bass in 2010 was 33.0/h, which was much higher than 2008 (7.0/h) and 2006 (2.0/h) (Figure 11). This increase is likely a response to the decrease in submersed aquatic vegetation in recent years.

The electrofishing catch rate of largemouth bass in 2010 was 157.0/h. This rate was similar to 2008 (176.0/h) but less than 2006 (265.0/h) (Figure 12). The decrease in abundance of aquatic vegetation in recent years likely contributed to this decrease in relative abundance. However, the abundance of largemouth bass  $\geq 14$  inches has remained stable (CPUE-14 range = 33.0-36.0 fish/h, Figure 10). Even though genetic analysis of the largemouth bass population will not be conducted until 2012, Bister and Brice (2007) reported the Florida largemouth bass allele frequency was 40.1% in 2006. Growth of largemouth bass was fast. Average age at 14 inches (13.1 to 14.8 inches) in 2008 was 2.5 years ( $N = 12$ ; range = 2 – 3 years). Average age at 14 inches (13.3 to 14.4 inches) in 2010 was 1.9 years ( $N = 15$ ; range = 1 – 4 years). Condition of largemouth bass was good with mean  $W_t$  for most inch groups  $>90$ .

**Crappie:** No crappie were collected during the fall 2010 trap netting survey. Bister and Brice (2007) reported only two crappie were collected during the 2006 survey.

## Fisheries management plan for Lone Star Lake, Texas

Prepared – July 2011

**ISSUE 1:** The abundance of aquatic vegetation in Lone Star Lake has decreased since 2006. Hydrilla was first observed in the reservoir between 2002 and 2006. Coverage was estimated at 36 acres in 2006 and herbicide treatments were conducted in 2006 and 2007. Hydrilla coverage was only 9.6 acres in 2010, but should be monitored to identify potential access problems in the future. Future management of hydrilla may be necessary to minimize expansion throughout the reservoir. Alligatorweed was also present and should be monitored.

### MANAGEMENT STRATEGY

1. Continue to provide technical guidance to the controlling authority regarding invasive aquatic plant management.
2. Conduct annual hydrilla/alligatorweed surveys to monitor trends and estimate coverage of invasive aquatic plants.

**ISSUE 2:** The largemouth bass population consisted of quality-sized fish as evidenced through fish population surveys and anecdotal reports from anglers in the early 2000s. Florida largemouth bass (FLMB) were stocked in Lone Star Lake in 2008 and 2009 to take advantage of an increase in submersed aquatic vegetation in the reservoir. However, recent decreases in aquatic vegetation at Lone Star Lake may adversely affect survival and recruitment of largemouth bass. Because the reservoir has the ability to support a quality largemouth bass fishery, the population should be monitored to assess changes related to habitat fluctuations and FLMB stocking efforts.

### MANAGEMENT STRATEGY

1. Conduct electrofishing surveys in 2012 and 2014 to monitor largemouth bass and prey fish populations.
2. Assess the genetic composition of the largemouth bass population in fall 2012.
3. As suitable aquatic vegetation returns in the reservoir, request FLMB stocking to enhance the trophy potential of the fishery.

**ISSUE 3:** The Texas Department of State Health Services (TDSHS) issued a fish consumption advisory due to PCB contamination for all fishes in Lone Star Lake in 2005. The Texas Parks and Wildlife Department is required to post signs at access areas on waterbodies that have consumption advisories.

### MANAGEMENT STRATEGIES

1. Continue to maintain consumption advisory signs at Lone Star Lake boat ramps.
2. Continue to refer public to TDSHS for more detailed information related to the advisory.

**ISSUE 4:** Anglers and stakeholders may be interested in fisheries management activities, fishing opportunities, and other issues at Lone Star Lake.

### MANAGEMENT STRATEGIES

1. Continue to provide news releases to the print and broadcast media.
2. Continue to provide fisheries presentations to public regarding issues/opportunities at Lone Star Lake.

**ISSUE 5:** Many invasive species threaten aquatic habitats and organisms in Texas and can adversely affect the state ecologically, environmentally, and economically. For example, zebra mussels can multiply rapidly and attach themselves to any available hard structure, restricting water flow in pipes, fouling swimming beaches and plugging engine cooling systems. Giant salvinia and other invasive vegetation species can form dense mats, interfering with recreational activities like fishing, boating, skiing and swimming. The financial costs of controlling or eradicating these types of invasive species are significant. Additionally, the potential for invasive species to spread to other river drainages and reservoirs via watercraft and other means is a serious threat to all public waters of the state.

#### MANAGEMENT STRATEGIES

1. Cooperate with the controlling authority to post appropriate signage at access points around the reservoir.
2. Contact and educate marina owners about invasive species, and provide them with posters and literature so that they can educate their customers.
3. Educate the public about invasive species through the use of appropriate media.
4. Discuss invasive species when presenting to constituent and user groups.
5. Document existing and future inter-basin water transfers to facilitate potential invasive species responses.

#### SAMPLING SCHEDULE JUSTIFICATION:

The proposed sampling schedule includes annual hydrilla surveys, a supplemental electrofishing survey in 2012, and required electrofishing, gill netting, and angler access surveys in 2014/2015 (Table 11). Annual hydrilla surveys are necessary to monitor management efforts and to provide coverage estimates to the controlling authority. Supplemental electrofishing in 2012 will be conducted to monitor the largemouth bass and prey fish populations. Genetic analysis of age-0 LMB in fall 2012 will be used to evaluate effectiveness of the 2008/2009 FLMB stockings.



## LITERATURE CITED

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- Bister, T. J., and M. W. Brice. 2007. Statewide freshwater fisheries monitoring and management program survey report for Lone Star Lake, 2006. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.
- DiCenzo, V. J., M. J. Maceina, and M. R. Stimpert. 1996. Relations between reservoir trophic state and gizzard shad population characteristics in Alabama reservoirs. North American Journal of Fisheries Management 16:888-895.
- Guy, C. S., R. M. Neumann, D. W. Willis, and R. O. Anderson. 2007. Proportional size distribution (PSD): a further refinement of population size structure index terminology. Fisheries 32(7):348.
- Ryan, M. J., and M. W. Brice. 2003. Statewide freshwater fisheries monitoring and management program survey report for Lone Star Lake, 2002. Texas Parks and Wildlife Department, Federal Aid Report F-30-R, Austin.

## Monthly Water Levels

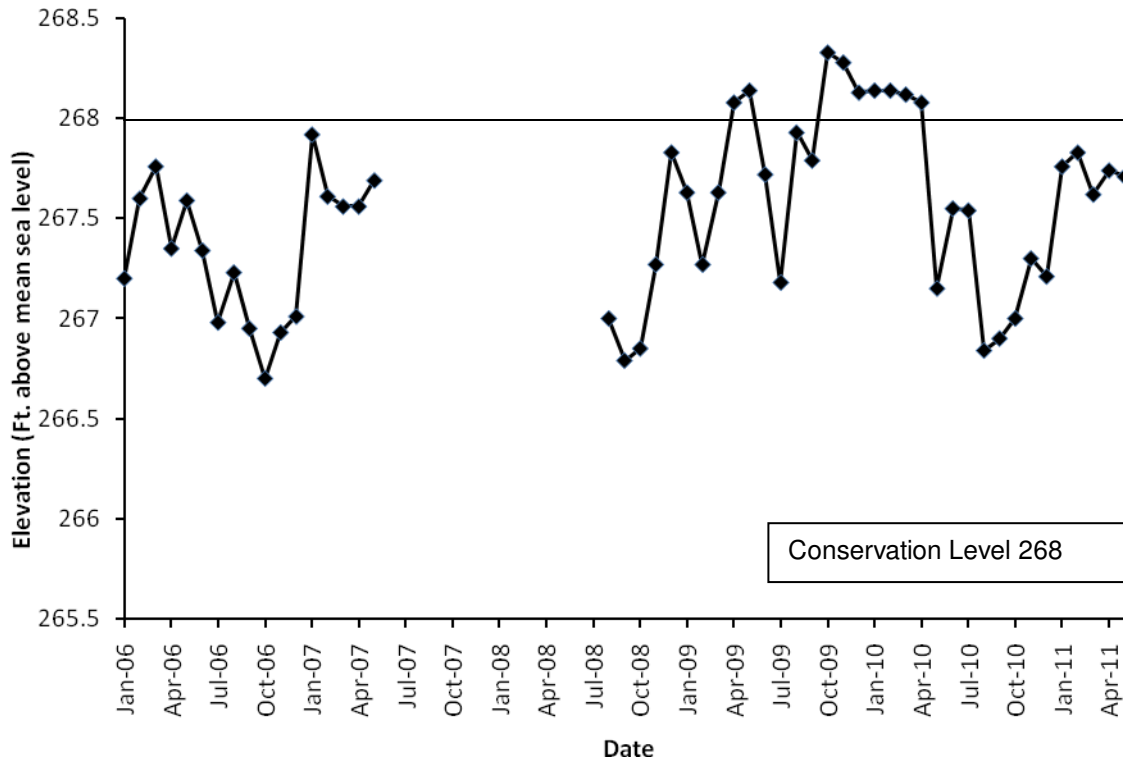


Figure 1. Monthly water level elevations in feet above mean sea level (MSL) recorded for Lone Star Lake, Texas. Horizontal line denotes conservation pool level (268 msl).

Table 1. Characteristics of Lone Star Lake, Texas.

Characteristic	Description
Year constructed	1943
Controlling authority	U. S. Steel Tubular Products, Inc.
County	Morris
Reservoir type	Mainstream
Shoreline development index (SDI)	2.6
Conductivity	218 umhos/cm

Table 2. Harvest regulations for Lone Star Lake, Texas.

Species	Bag Limit	Minimum-Maximum Length (inches)
Catfish, channel and blue catfish, their hybrids and subspecies	25 (in any combination)	12 - No Limit
Catfish, flathead	5	18 - No Limit
Bass, white	25	10 - No Limit
Bass, palmetto	5	18 - No Limit
Bass, largemouth	5 <sup>a</sup>	14 – No Limit
Bass, spotted	5 <sup>a</sup>	No Limit - No Limit
Crappie, white and black crappie, their hybrids and subspecies	25 (in any combination)	10 - No Limit

<sup>a</sup> Daily bag for largemouth bass and spotted bass = 5 in any combination.

Table 3. Stocking history of Lone Star Lake, Texas. Life stages are fry (FRY), fingerlings (FGL), and unknown (UNK). Life stages for each species are defined as having a mean length that falls within the given length range. For each year and life stage the species mean total length (Mean TL; in) is given. For years where there were multiple stocking events for a particular species and life stage the mean TL is an average for all stocking events combined.

Species	Year	Number	Life Stage	Mean TL (in)
Florida largemouth bass	1990	153,238	FRY	0.8
	1995	75,013	FGL	1.4
	2008	151,608	FGL	1.5
	2009	152,108	FGL	1.6
	Total	531,967		
Palmetto bass (striped X white bass hybrid)	1983	16,500	UNK	UNK
	1997	15,253	FGL	1.1
	1999	7,636	FGL	1.5
	2002	15,264	FGL	1.5
	2004	14,300	FGL	2.5
	2005	14,328	FGL	1.5
	Total	83,281		

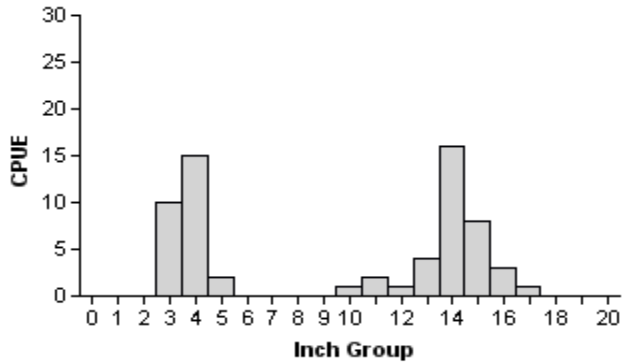
Table 4. Survey of littoral zone and physical habitat types, Lone Star Lake, Texas, 2010. A linear shoreline distance (miles) was recorded for each habitat type found. Surface area (acres) and percent of reservoir surface area was determined for each type of aquatic vegetation found.

Shoreline habitat type	Shoreline Distance		Surface Area	
	Miles	Percent of total	Acres	Percent of reservoir surface area
Bulkhead	2.6	14.4		
Natural shoreline	11.2	61.9		
Natural shoreline & boat docks	2.8	15.5		
Rocky shoreline	1.0	5.5		
Rocky shoreline & boat docks	0.5	2.7		
Native submerged vegetation			49.6	3.6
Native emergent vegetation			25.8	1.8
Native floating-leaved			3.7	0.3
Non-native				
Alligatorweed			21.3	1.5
Hydrilla			9.6	0.7

## Gizzard Shad

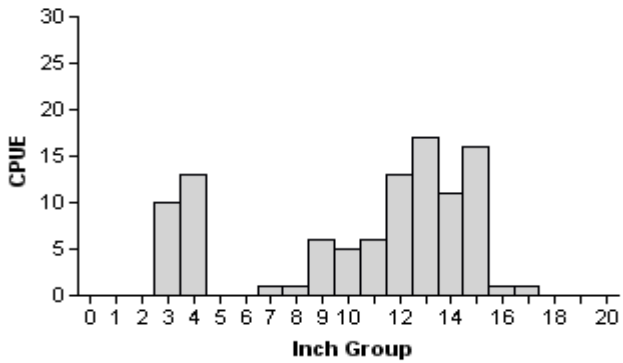
**2006**

Effort = 1.0  
Total CPUE = 63.0 (19; 63)  
IOV = 43 (8.7)



**2008**

Effort = 1.0  
Total CPUE = 101.0 (30; 101)  
IOV = 24 (16.3)



**2010**

Effort = 1.0  
Total CPUE = 77.0 (29; 77)  
IOV = 42 (14.3)

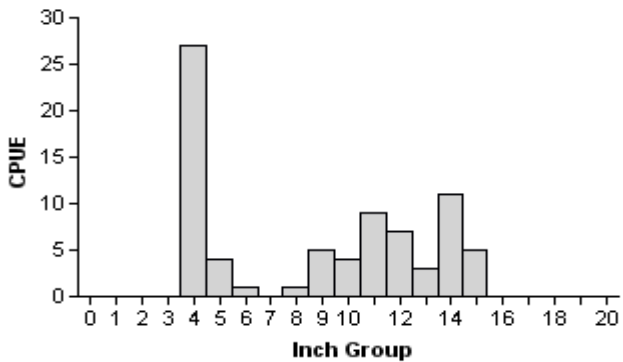
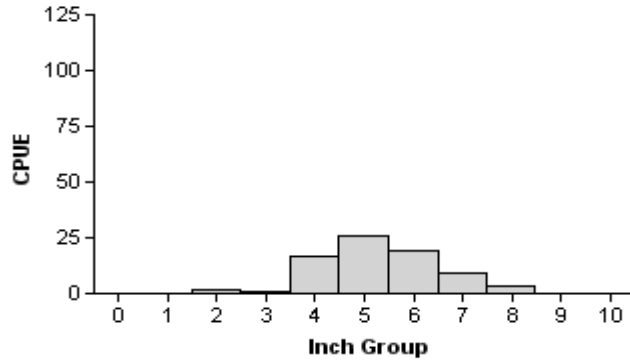


Figure 2. Number of gizzard shad caught per hour (CPUE) and population indices (RSE and N for CPUE and SE for IOV are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 2006, 2008, and 2010.

## Redbreast Sunfish

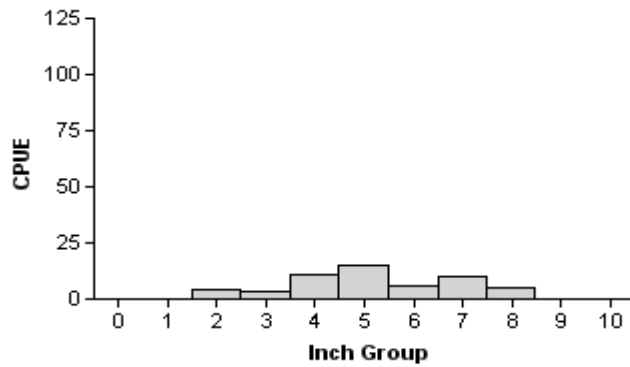
**2006**

Effort = 1.0  
Total CPUE = 77.0 (28; 77)



**2008**

Effort = 1.0  
Total CPUE = 54.0 (50; 54)



**2010**

Effort = 1.0  
Total CPUE = 275.0 (34; 275)

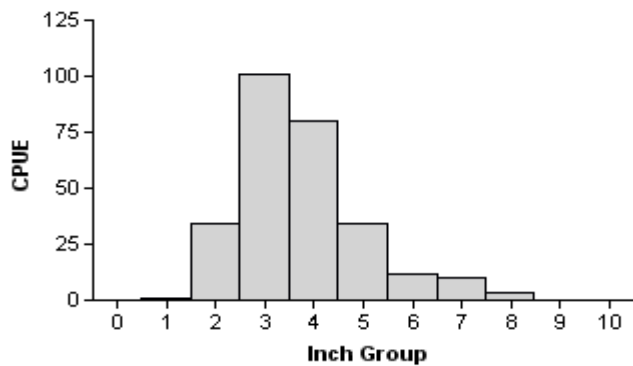
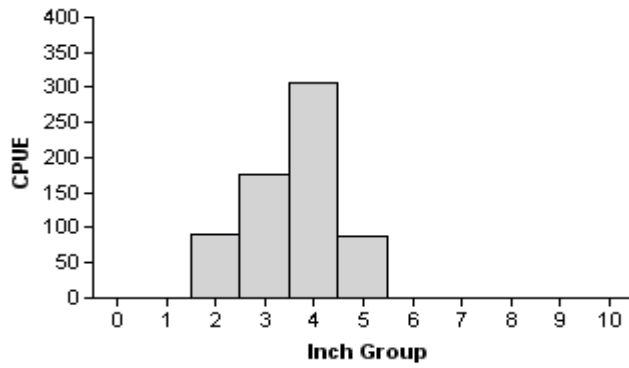


Figure 3. Number of redbreast sunfish caught per hour (CPUE) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 2006, 2008, and 2010.

## Bluegill

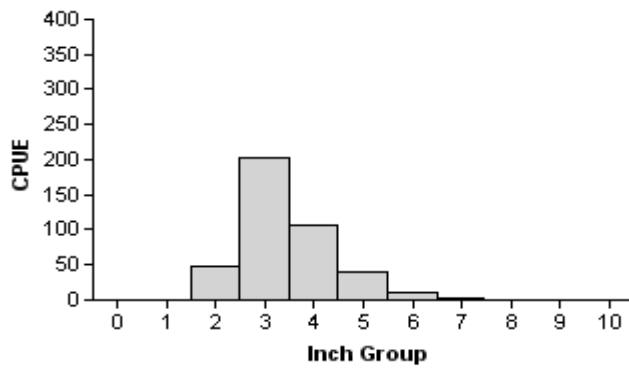
**2006**

Effort = 1.0  
Total CPUE = 663.0 (14; 663)



**2008**

Effort = 1.0  
Total CPUE = 413.0 (21; 413)



**2010**

Effort = 1.0  
Total CPUE = 819.0 (11; 819)

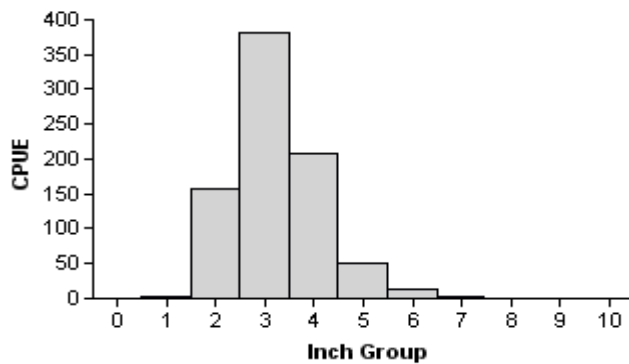


Figure 4. Number of bluegill caught per hour (CPUE, bars) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 2006, 2008, and 2010.

## Redear Sunfish

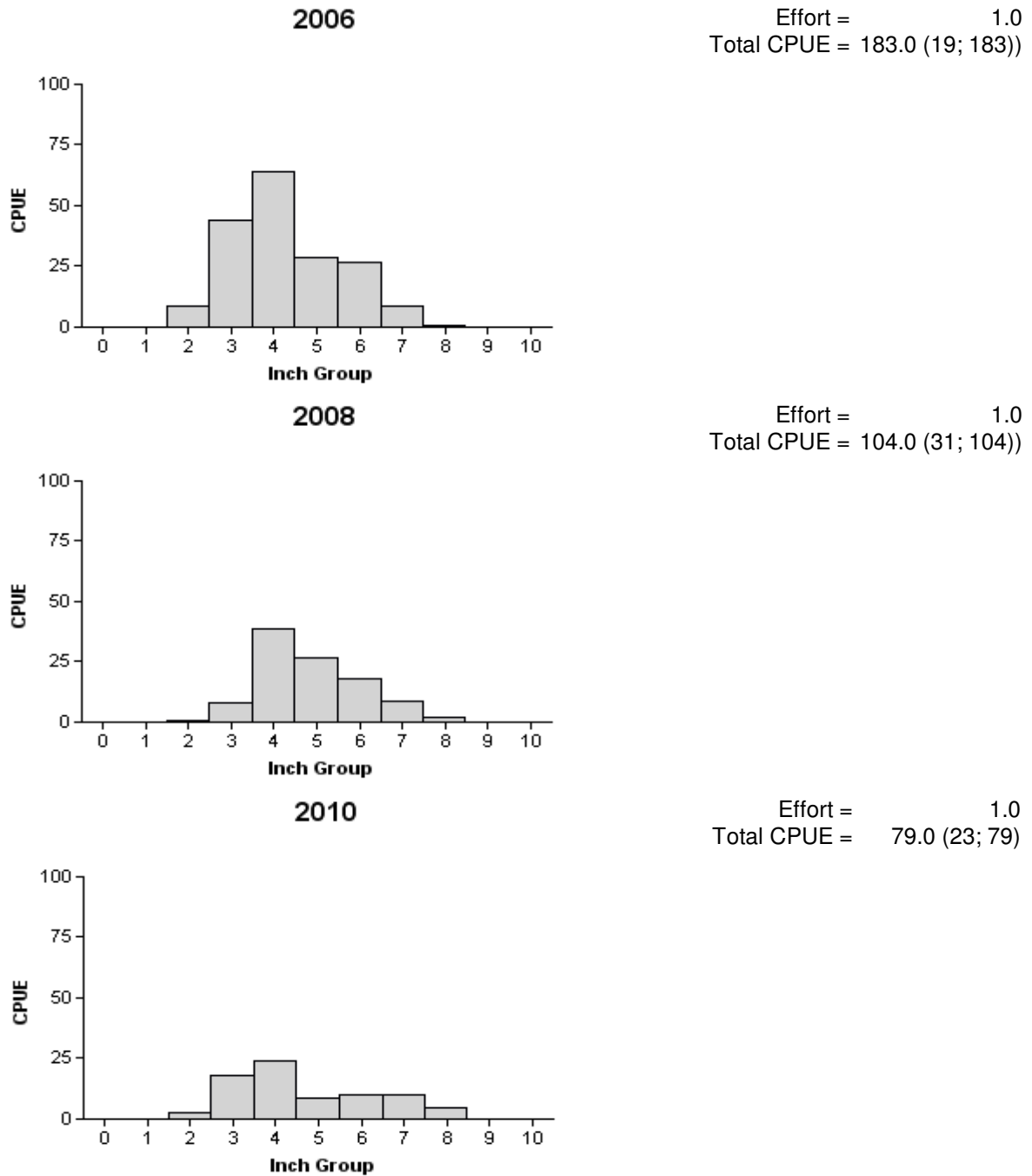


Figure 5. Number of redear sunfish caught per hour (CPUE, bars) and population indices (RSE and N for CPUE are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 2006, 2008, and 2010.



## Channel Catfish

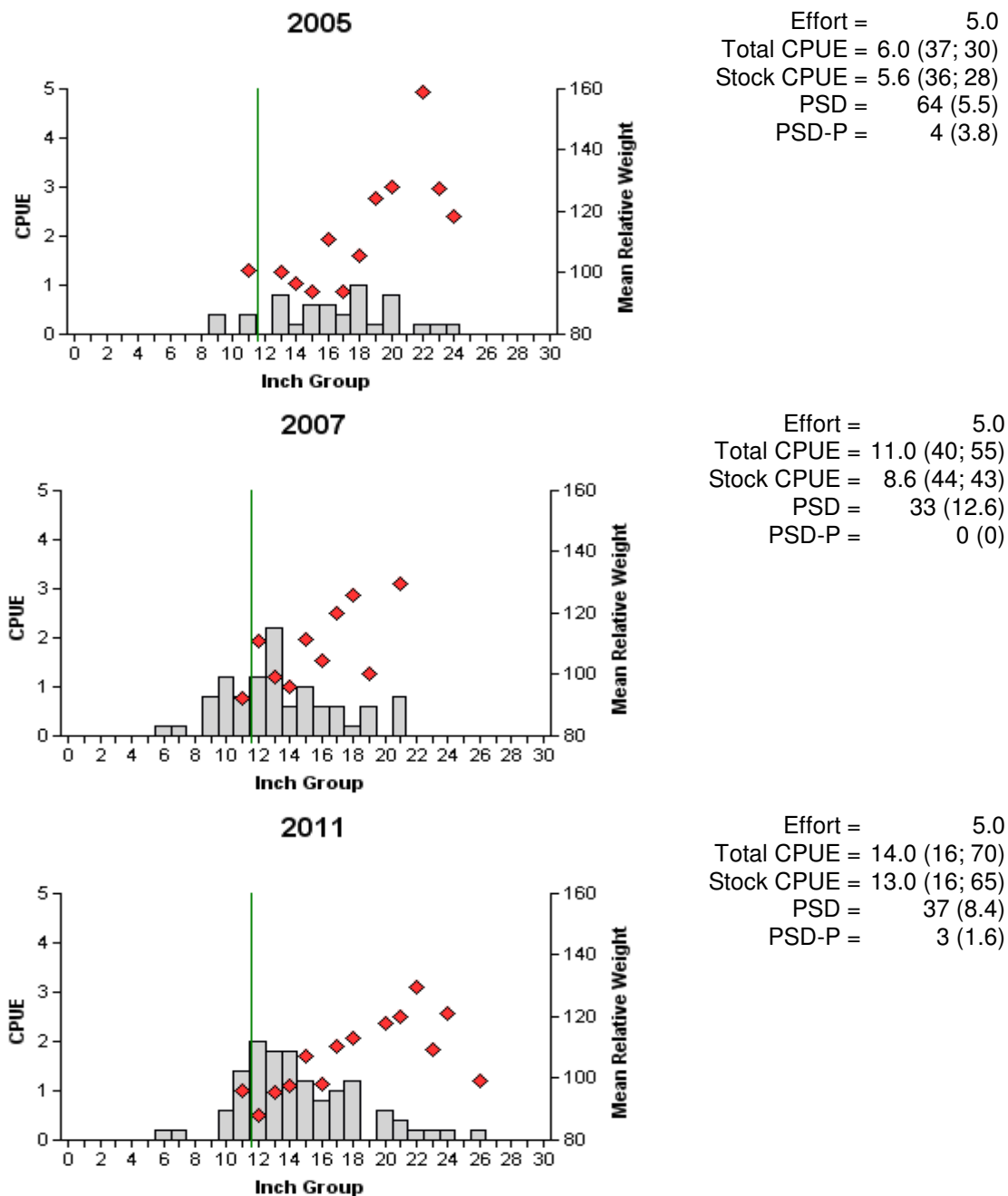


Figure 6. Number of channel catfish caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lone Star Lake, Texas, 2005, 2007, and 2011. Vertical lines indicate minimum length limit.

## White Bass

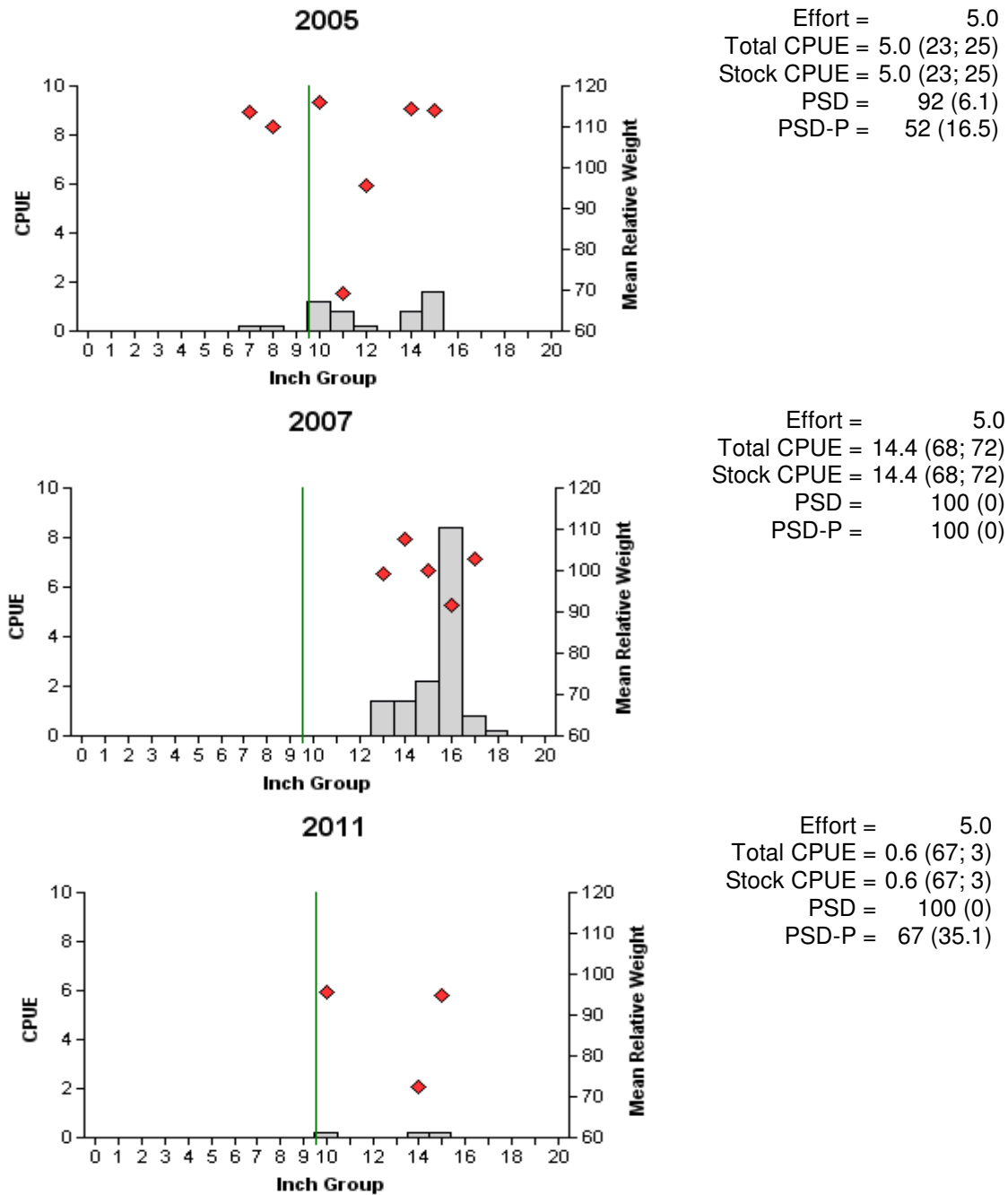


Figure 7. Number of white bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lone Star Lake, Texas, 2005, 2007, and 2011. Vertical lines indicate minimum length limit.

## Palmetto Bass

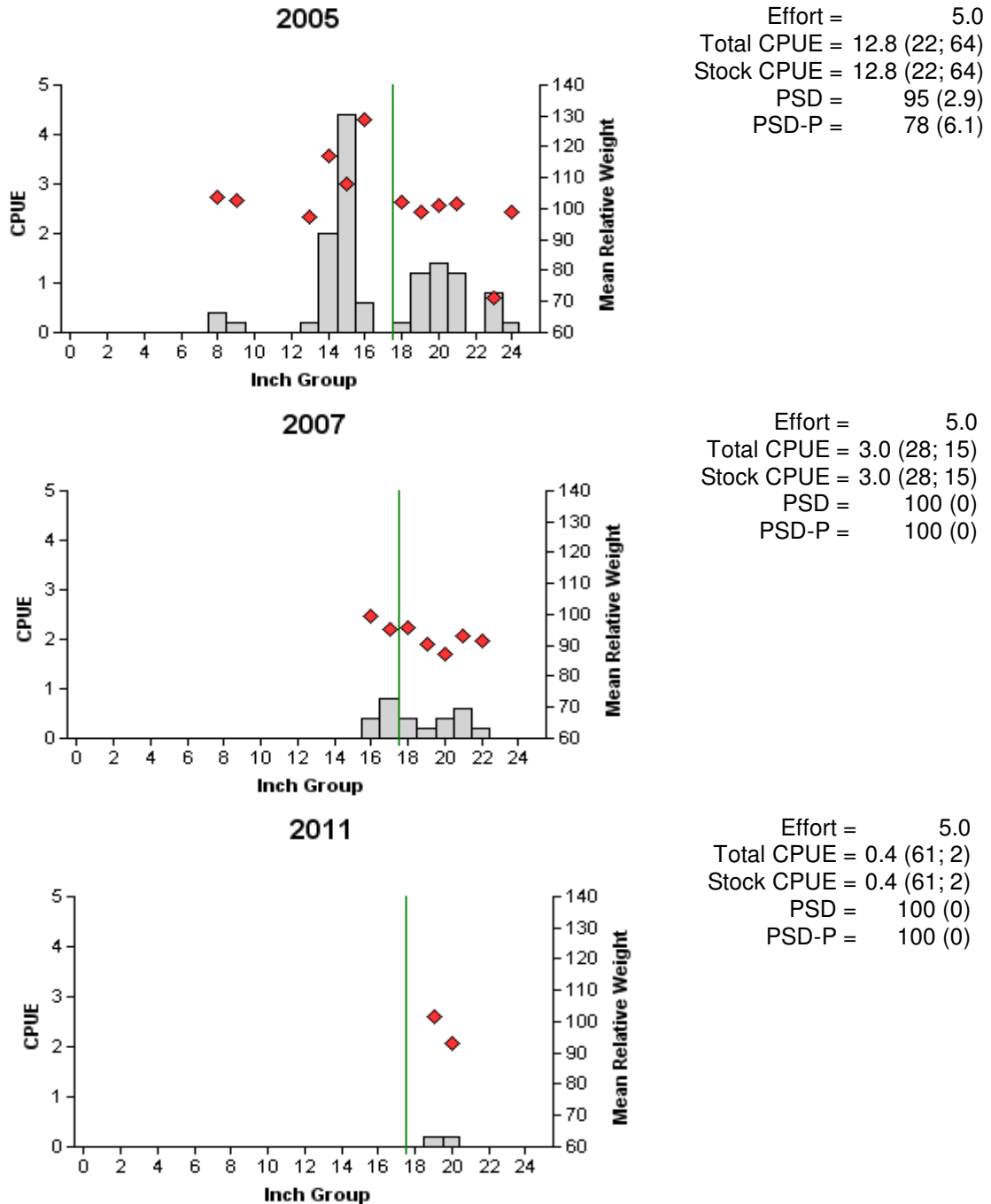


Figure 8. Number of palmetto bass caught per net night (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for spring gill net surveys, Lone Star Lake, Texas, 2005, 2007, and 2011. Vertical lines indicate minimum length limit.

## Spotted Bass

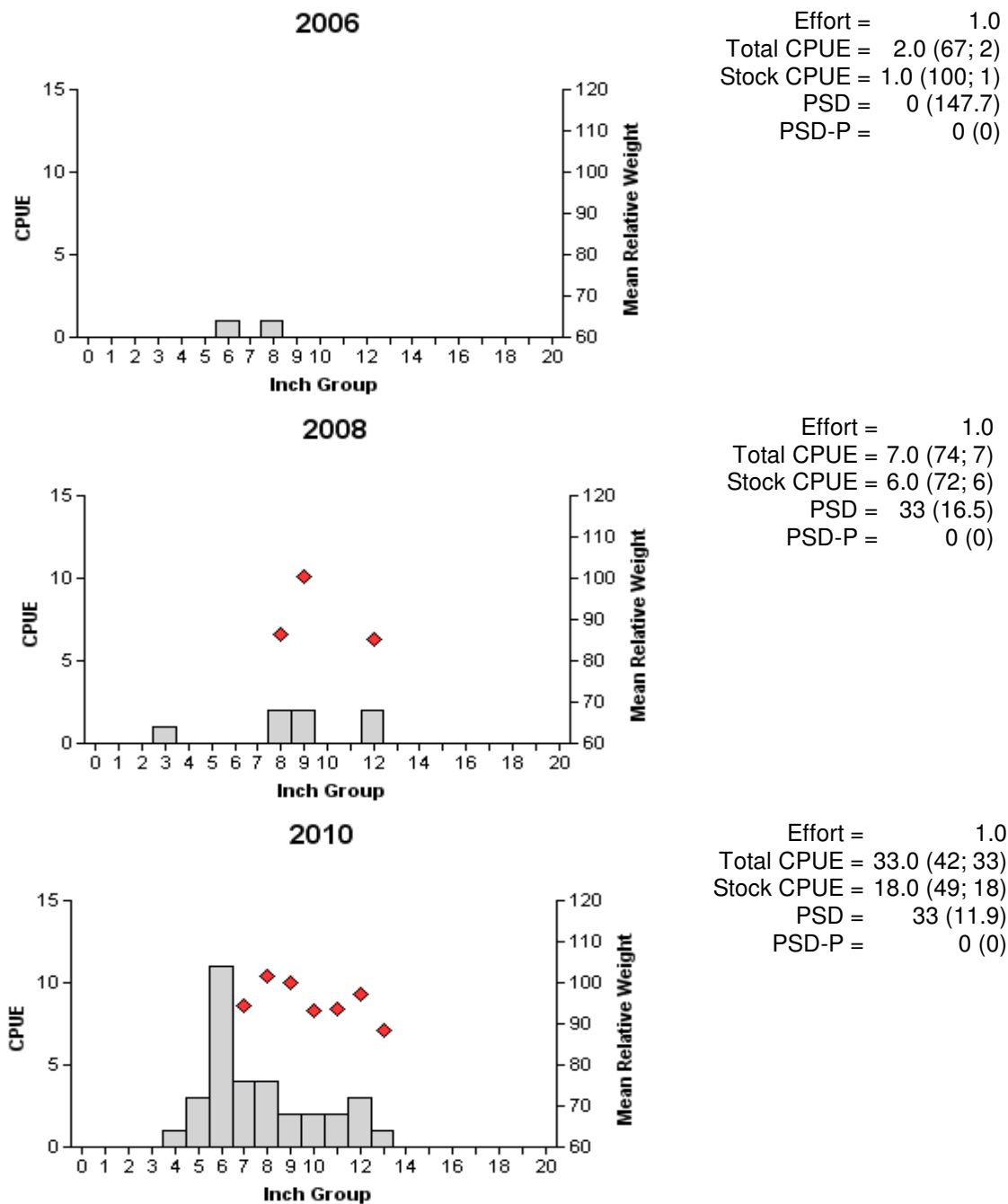


Figure 9. Number of spotted bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 2006, 2008, and 2010. Relative weight data was not collected in 2006.

## Largemouth Bass

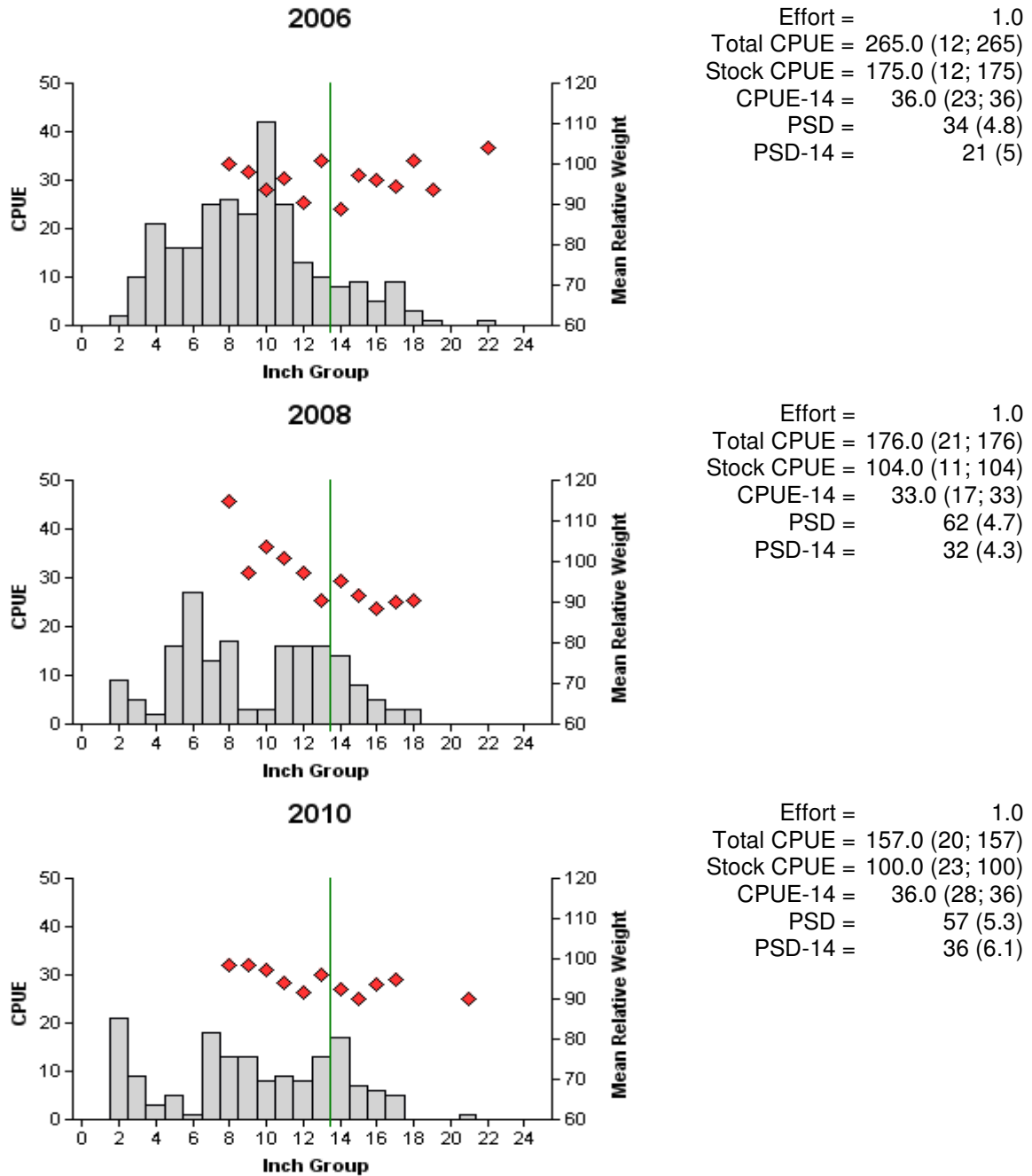


Figure 10. Number of largemouth bass caught per hour (CPUE, bars), mean relative weight (diamonds), and population indices (RSE and N for CPUE and SE for size structure are in parentheses) for fall electrofishing surveys, Lone Star Lake, Texas, 2006, 2008, and 2010. Vertical lines indicate minimum length limit.

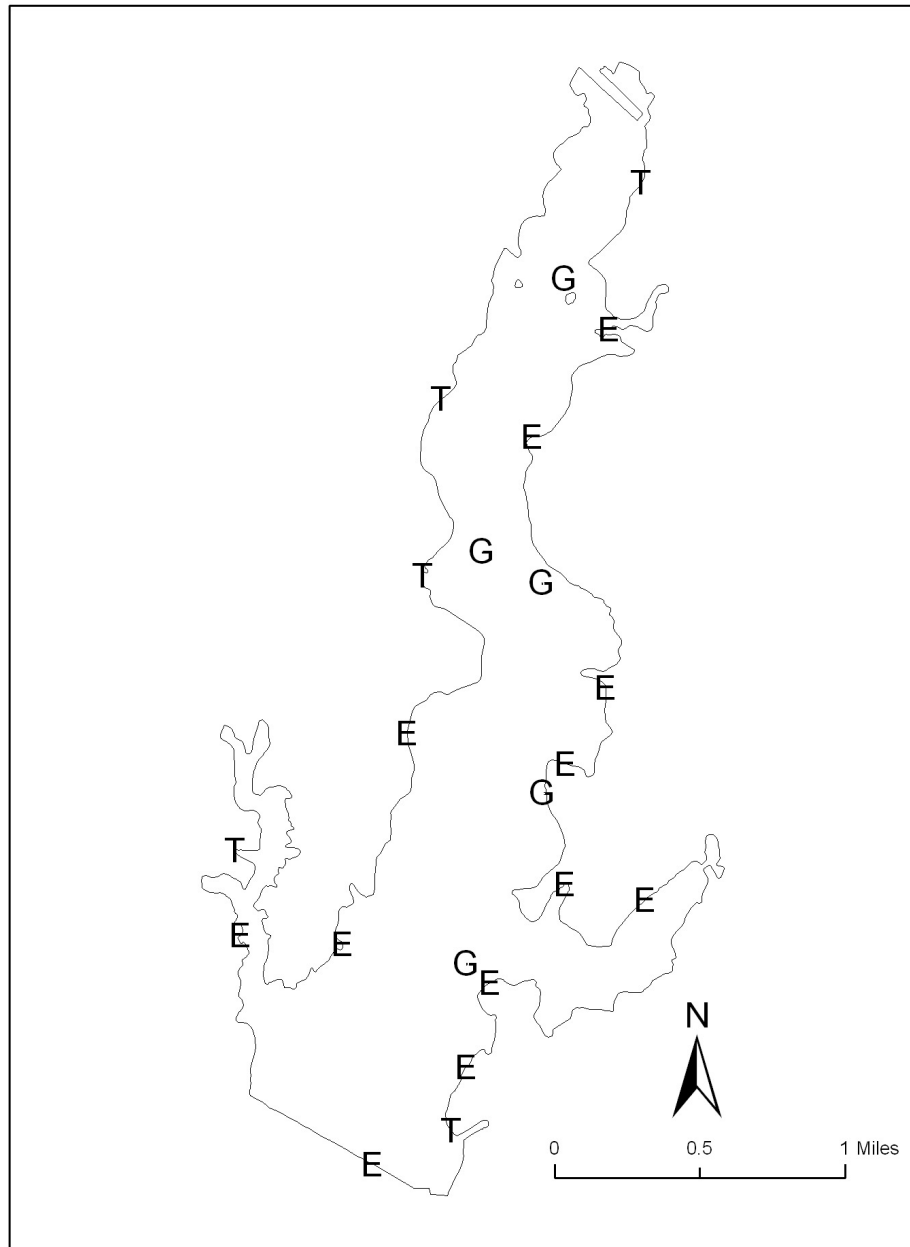
Table 5. Proposed sampling schedule for Lone Star Lake, Texas. Gill netting surveys are conducted in the spring, vegetation surveys are conducted in the summer, and electrofishing and trap netting surveys are conducted in the fall. Standard survey denoted by S and additional survey denoted by A.

Survey Year	Vegetation	Electrofisher	Access	Gill Net	Report
Summer 2011 - Spring 2012	A				
Summer 2012 - Spring 2013	A	A			
Summer 2013 - Spring 2014	A				
Summer 2014 - Spring 2015	S	S	S	S	S

**APPENDIX A**

Number (N) and catch rate (CPUE) of all target species collected from all gear types from Lone Star Lake, Texas, 2010 - 2011.

Species	Gill Netting		Trap Netting		Electrofishing	
	N	CPUE	N	CPUE	N	CPUE
Gizzard shad					77	77.0
Threadfin shad					126	126.0
Warmouth					8	8.0
Bluegill					819	819.0
Redbreast sunfish					275	275.0
Dollar sunfish					12	12.0
Longear sunfish					234	234.0
Redear sunfish					79	79.0
Redspotted sunfish					1	1.0
Channel catfish	70	14.0				
White bass	3	0.6				
Palmetto bass	2	0.4				
Spotted bass					33	33.0
Largemouth bass					157	157.0
White crappie			0	0		
Black crappie			0	0		

**APPENDIX B**

Location of sampling sites, Lone Star Lake, Texas, 2010-2011. Trap netting, gill netting, and electrofishing stations are indicated by T, G, and E, respectively.